

ABSTRACT OF THE DISCLOSURE

A scalable packet forwarding approach to speed up unicast and multicast routing-table lookups in the Internet which we refer to as "Cluster-based Aggregation Switching Technique" or "CAST". CAST integrates the use of two mechanisms: (i) organizing table entries into clusters and (ii) using cluster-label swapping so that packets can refer to specific clusters within which the routing-table lookup should take place. The motivation for introducing CAST is the escalating rate of improvement of Internet bandwidth available at backbone routers, which continues to exceed the maximum rate of packet processing power of high-speed routers. Simulations show that the hybrid approach used in CAST to expedite routing table lookups is more attractive for unicast routing than all prior approaches in terms of its lookup power and total memory size. Furthermore, CAST applies equally well to multicast routing, while many prior schemes do not.